

Features and Benefits

Features and benefits of the TCS platform at the customer access of a carrier network are:

- The ability to quickly adapt or add custom functionality to meet individual customer connection and feature requirements
- The ability to monitor performance of and support the various applications independently through the TCS Network Operations Center manned 24 x 7
- TCS network support staff work closely with a carrier's operation group and trouble reporting systems to maintain a single point of contact to the customers who require service relating to their unique applications
- The USM™ platform can be added to any VPN access node providing enhanced services through the TCS Service Bureau
- The ability to perform virtually unlimited CLI validations and query external customer databases for CLI validation as an option
- More economical routing of calls through independent on-net or off-net switching capabilities and utilization of call re-origination as an alternative routing solution for specific calls
- The ability to support SS7/C7 protocols thereby extending the carrier's intelligent network (IN) out to the customer access points
- The ability to cost justify more switching nodes and maintain cost efficiencies with the high density port capacity of the Excel switch

User interface, alarms and CDR output of our switching platform can be tailored so that administration and maintenance functions maintain a "look and feel" consistent with traditional tandem switching systems already deployed in a network. This powerful design aspect minimizes the need to retrain personnel and delivers maximum transparency of the TCS system within the existing network.

TCS Development and Delivery of VPN Features and Functions

TCS' VPN 1.0 RELEASE - NOW AVAILABLE

- Flexible dialing plans and digit translation tables to support all variations of on-net and off-net dialing sequences
- Supports a virtually unlimited number of CLI validation codes
- A programmable protocol language tool to support standard and custom variations of SS7/C7 protocols
- Switch operating system edits through command line or graphical interface
- Standard output of switch alarms and diagnostic messages to multiple network management terminals
- Support for customized international network tone sets

TCS' VPN RELEASE 2.0

- Includes all of the features of VPN Release 1.0
- EXNET support for linking multiple switches - up to 8000 ports
- Compliance to ITU Q.50 specifications with regard to the switch interface to DCME equipment for dynamic load control

TCS VPN RELEASE 3.0

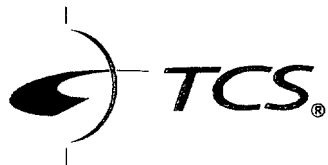
- Includes all of the features of VPN Release 2.0
- Switch Operating System supports embedded database with standard ODBC interface for custom table creation
- Expanded EXNET support for linking multiple switches - up to 32,000 ports
- Unbundled Call Routing through TCS' Global Facilities Manager Intelligent Network Database
- Direct links from the switch to external CLI databases and Call Center ACD Systems through ODBC compliant connections
- Java® web based network management tools

For More Information

To learn more about the benefits of expanding your private network capabilities through Virtual Private Network services, or to arrange for a demonstration of our capabilities, call us at 1-954-712-0500.

A Virtual Private Network (VPN) is a segment of a carrier's network allocated to a closed user group's private traffic. VPN is a cost-effective tool that enables multi-national corporations, geographically dispersed call centers, prominent organizations and network aggregators to realize the benefits of a global private network without investing in significant infrastructure.





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New carriers poised to break VPN stranglehold

BY CAMILLE MENDLER
• MIAMI, FLORIDA

Start-up operators and service providers are poised to muscle in on the jealously guarded territory of facilities-based operators—the virtual private network.

Cheap new switching platforms entering the market are making it possible for operators with minimal infrastructure to set up a VPN service in weeks, compared with the months of testing required in traditional buildouts.

VPNs are one of the few remaining strongholds for traditional carriers, and a major draw for multinational customers that need global inter-office connectivity and associated voice-handling services.

But analysts say the opening of national markets combined with lower-cost technology will bring VPNs to a much wider audience beyond the multinational corporation.

"Ways to add value are limited in lower tiers of the market, but middle tier companies are very interested in VPNs—the concept is accepted," said Jim Sadowski, principal at Sadowski and Associates Inc., a Dallas, Texas-based consultancy. He is developing a VPN platform for a new entrant in Belgium.

But one of the first to market could be Technology Control Services Inc. (TCS), a Miami, Florida-based service provider that has evolved from callback operation to call reorigination, calling card and billing services. "We've at-



Butler: Out-of-the-box VPN

tempted to build an out-of-the-box product," said David Butler, TCS president. "Our experience is that it takes about 30 to 45 days to deploy each node in new countries."

TCS has tested its VPN service in the United States, Europe and Asia. It plans to sell both its VPN service and platform to other operators and corporates.

Key combination

The key to the new VPN services is the combination of high-end servers with programmable switches from firms such as Excel Inc., of Hyannis, Maine, Arbinet of New York, and Summa Four Inc. of Manchester, New Hampshire. Traditional buildouts rely on the deployment of tandem switches from vendors such as Alcatel, L.M. Ericsson and

Northern Telecom Ltd., combined with intelligent networking technology to extend the carrier network.

By contrast, TCS's solution uses an Excel switch, an Alpha server from Digital Equipment Corp., and an Oracle Corp. database and transaction software—all at a tenth of the cost of traditional solutions.

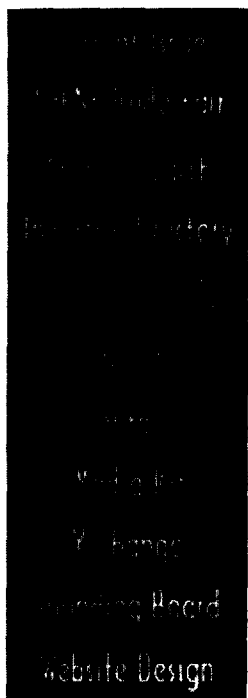
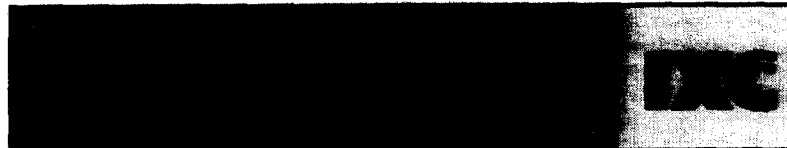
However, a major catch is that these VPNs offer limited services, such as number translation and calling line identification, and have limited call-handling levels. Conference calling and re-routing can pose problems. Nevertheless, most organizations only make use of basic VPN services, say analysts.

Major users say it is unlikely that new VPN entrants could serve their global needs, but want to encourage smaller players as they bring market diversity, said Malcolm Wollaston at 3M United Kingdom plc, in Bracknell, England, a founding member of the European VPN Users Association. He argued, however, for interoperability between different VPN service offerings.

"VPNs are a basic requirement in the service portfolio and for service providers in particular this is a good entry point," said John Matthews, principal consultant at Ovum Ltd. in London. "Until carriers open up management layers to their network—or the next pig flies by my window—this may well prove effective for them to compete." ■

ATTACHMENT 4

"Wholesale Report Card"
Phone+ Magazine, May 1998



Wholesale Report Card

Resellers Give Underlying Carriers a C+

By William West and Judy Reed Smith

It's no secret that Wall Street loves network providers. This article was written on the heels of wholesaler Qwest Communications International Inc.'s bid for the much larger retailer LCI International Inc.--a bid that was wholly funded by the smaller company's significantly larger market cap of \$7 billion. At a time when MCI Telecommunications Corp. is being pulled under the WorldCom Inc. umbrella, no one is unconquerable, regardless of size.

Wholesale providers of long distance services (both domestic and international) are fighting for more than minutes; they are fighting to remain on top of the acquisition heap.

Most certainly, Wall Street's love affair with network providers gives wholesalers a distinct financial advantage over retail players in the near-term. However, their networks are built for one purpose: to pass telecom traffic. This simple purpose is complex to implement efficiently and reliably, resulting in far-reaching profitability implications for wholesalers and retailers alike. While one would expect to see intensified competition equate to across-the-board improvements in performance among wholesalers, the 1998 edition of ATLANTIC*ACM's Wholesale Long Distance Carrier Report Card, first published in 1996, finds that not to be the case.

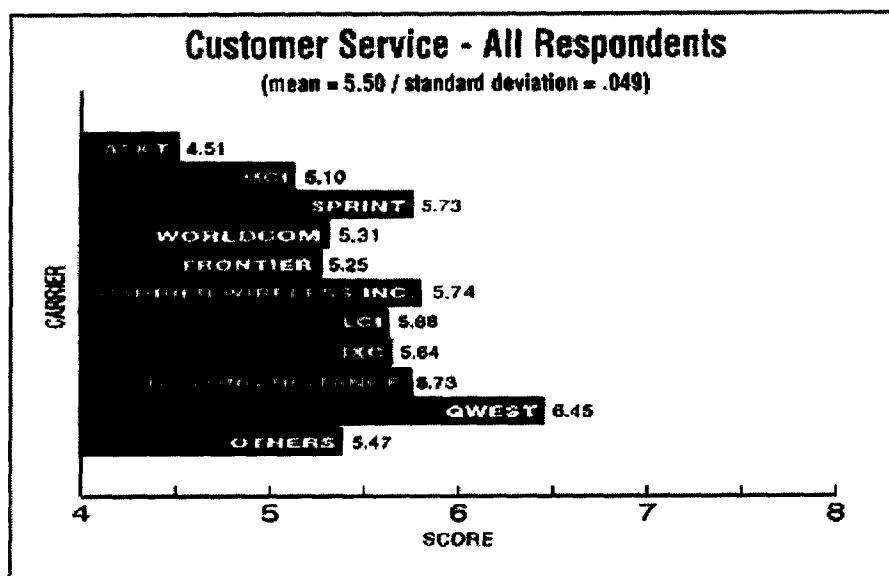
Overall Performance

Based on performance rankings provided by their resale customers, smaller wholesale long distance telecommunications service providers score better overall, particularly among switchless resellers responding to ATLANTIC*ACM's survey. This finding indicates the increasing importance of wholesale services in the overall product mix of these smaller providers which, under the pressure of slimming margins, will allow others to ride their contracts at or near cost to leverage better buying rates from wholesale carriers themselves. This makes the indirect value of the wholesale minute greater than its direct value as it affects the overall profitability of the resellers' retail customers.

Although leading wholesalers have not improved in every category--

provisioning, network, service, products and pricing--ranked in the ATLANTIC*ACM study, they are showing improvements overall. Generally, wholesale customers ranked underlying carriers almost exactly the same as they did in 1996--the equivalent of a C+. As price differences among competitors diminish over time due to falling rates, wholesalers are expected to focus on other categories to find their competitive edge.

Among reseller types--switchless and facilities-based--that responded to the ATLANTIC*ACM survey, individual wholesale carrier scores varied. Sprint Communications Co. and LCI International, along with a group of smaller players classified as "other," received some of the top scores given by switchless resellers. Facilities-based carriers reselling long distance gave their best rankings to Qwest Communications.



Category Rankings

Billing. Generally wholesale carriers performed similarly in 1998 as in 1996, receiving scores slightly above average for both years. As in 1996, larger carriers were ranked below the mean score, earning criticism primarily for their systems' inflexibility.

Provisioning. Wholesale carriers were ranked slightly worse in 1998 than in 1996 for performance in provisioning. Again in 1998, smaller underlying carriers generally outranked the large ones with the exception of Sprint, which scored above the mean--an improvement of nearly a full point (on a scale of one to 10) over their 1996 rankings. Other improvements were noted for LCI International and Qwest, which led the pack in this category.

Network. Overall scores for network quality and reliability were down slightly from the 1996 survey. The Big Four carriers held onto the top spots followed by Qwest, which received an improved ranking from seventh to fourth. Additionally, Frontier Corp. ranked significantly better, up more than a point to capture the fifth spot.

Significantly, MCI nudged out AT&T Corp. for the top ranking among switchless resellers. WorldCom, Frontier and LCI International performed better among facilities-based carriers than among switchless resellers.

Service. As in 1996, service scores, on average, were the lowest among all the categories ranked, suggesting this is still an area where carriers can improve. Qwest scored significantly higher than the other carriers, and improved its score almost two full points over its 1996 score. "Other" providers received the highest scores among switchless resellers, indicating that small wholesalers have found a niche in providing strong service.

Products. Wholesale providers received highest marks in the products category. AT&T earned the highest product scores overall, moving up from eighth in 1996 to first in 1998. The Big Four performed the best among both reseller types that responded to the ATLANTIC*ACM survey. Generally, switchless resellers gave carriers higher scores--7.5 on a 10-point scale--for products than facilities-based carriers, which only allotted 6.8 on the same scale.

Pricing. Rankings for pricing among wholesale providers stayed relatively constant from 1996 to 1998. The Big Four, not surprisingly, scored the worst once again. Bumping Frontier, Qwest became the front-runner in the pricing category for all respondents, up from fifth in 1996. Frontier maintained a high score among switchless resellers, which gave the carrier the No. 2 spot behind the group of various small providers. Scoring by facilities-based carriers followed the trend of high price with large size with the exception of WorldCom, which they ranked third best in price.

Conclusion

ATLANTIC*ACM's survey results reveal that resellers are using more underlying carriers than in 1996, suggesting that opportunities remain for wholesale providers that can supply a competitive product. Declining prices, in particular, are forcing wholesalers to employ new means of differentiation. One response appears to be diversified product offerings, such as wholesalers' advancing international service integration. In addition, low scores in service provision indicate that this area presents an opportunity for a service-oriented wholesaler to gain an edge. In the future, those wholesale providers that demonstrate a service-oriented strategy will be most likely to improve their standing in the industry and improve customer retention.

*William West is principal and Judy Reed Smith is chief executive officer of ATLANTIC*ACM, a Boston-based strategy consulting firm. Information for this article was taken from ATLANTIC*ACM's Wholesale Carrier Report Card published in May 1998. For more information, call (617) 720-3700, fax (617) 720-1077, e-mail atlantic@atlantic-acm.com, or web: www.atlantic-acm.com*

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